



Flow, Pressure, and On/Off Control Devices

This section includes stainless needle valves, our combination on/off needle valves, high pressure prime/purge and on/off valves, and VICI pressure regulators and flow controllers.

Because cast parts can introduce porosity and contamination, every VICI control device is assembled from components which are precision-machined from bar stock. This assures that every item has the same high quality workmanship, with careful assembly and testing to rigid standards.

On/Off and Prime/Purge Valves

Valco high pressure on/off or prime/purge valves feature quality engineering, precision machining, and extremely low internal volume (< 2 μ l), making them the ideal choice in the most demanding liquid or supercritical fluid chromatography or extraction systems.* The on/off function is self-explanatory; in prime/purge models, mobile phase flows around the needle when the valve is closed, relieving the back pressure from the column. When the valve opens, mobile phase vents to waste to prime the pump.

Standard models provide leak-tight operation up to 10,000 psi (690 bar) at 100°C, with high temperature versions rated up to 6,000 psi/300°C. A 1/16" fitting model with a larger bore and a 1/8" fitting model are available for high flow applications.

The valve needle is made from a special high strength alloy which is resistant even to the buffer salts which might accidentally precipitate inside the valve. Seals are fluorocarbon, with valve bodies machined from HPLC grade stainless steel, ensuring long lifetime in even the most demanding situations.

The on/off and prime/purge valves are available in manual or air/CO₂ actuated versions. The automated valves require a single three-way solenoid: application of 50 psi opens the valve; venting the air allows the spring to return the valve to the closed position.

**Not suitable for use with gases.*



ULTRA-HIGH PRESSURE VALVES

See our new 40,000 psi on/off and prime/purge valves

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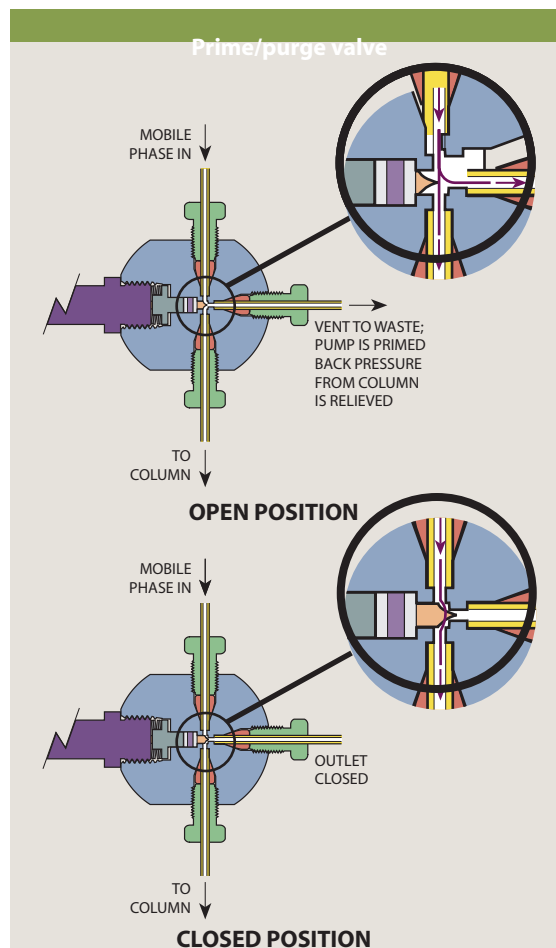
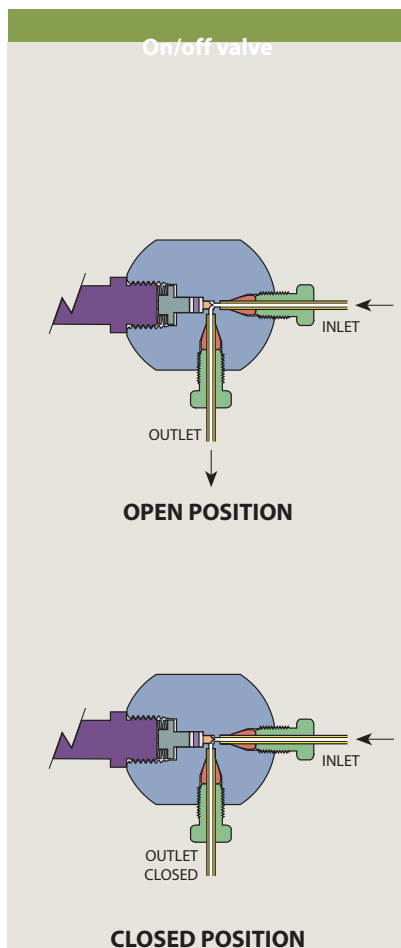
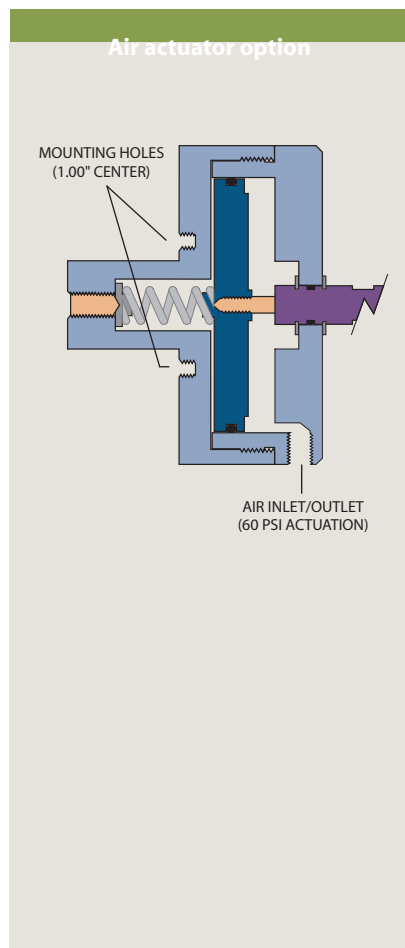
CHROMalytic TECHNOlogy Pty Ltd AUSTRALIAN Distributors e-mail: sales@chromtech.net.au Tel: 03 9762 2034

On/off valves

SPECS			Manual		Manual with 4" standoff	Air actuated with 1" standoff	Air actuated with 4" standoff
Temp	Pressure		Fitting size	Bore	Prod No	Prod No	Prod No
Standard temperature							
1/16"	100°C	10,000 psi	1/16"	0.50 mm	SFVO	–	ASFVO
				0.75 mm	SFVOL	–	ASFVOL
High temperature / high pressure							
1/16"	300°C	6,000 psi	1/16"	0.50 mm	SFVOHT	SFVOHT4	ASFVOHT
1/8"	300°C	2,000 psi		0.75 mm	–	–	ASFVOLHT
			1/8"	1.50 mm	–	–	ASFVO2HT

Prime/purge valves

SPECS			Manual		Air actuated with 1" standoff	Air actuated with 4" standoff
Temp	Pressure		Fitting size	Bore	Prod No	Prod No
Standard temperature						
1/16"	100°C	10,000 psi	1/16"	0.50 mm	SFV	ASFV
				0.75 mm	SFVL	ASFVL
High temperature / high pressure						
1/16"	300°C	6,000 psi	1/16"	0.50 mm	–	ASFVHT
1/8"	300°C	2,000 psi		0.75 mm	–	ASFVLHT
			1/8"	1.50 mm	–	ASFV2HT



Combo Valves

A new generation needle and shut-off valve provides screwdriver-adjustable control and positive shut-off without damage to the needle. It is ideal for providing hydrogen and air to an FID, since the flow setting is not changed by turning the valve on and off. It can also be used to supply make-up or combustion gas in a wide variety of applications.

The valve body materials are anodized aluminum or stainless steel, with Viton

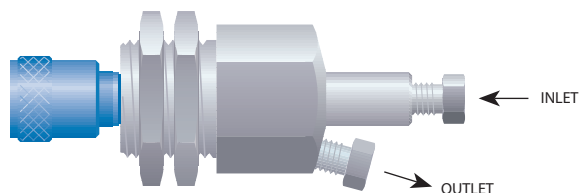
O-ring seals. Maximum temperature is 100°C, and maximum inlet pressure is 100 psig. The valve can be panel-mounted in an 11/16" or 3/4" hole, using hardware supplied, and all are supplied with Valco 1/16" ZDV fittings. Other configurations are available in OEM quantity upon request.

The standard knob is silver-colored and .62" long. Colored knobs for gas identification are available separately, in two lengths.

Combo valves

Maximum flow @ 40 psi He or N ₂	Aluminum body <i>Prod No</i>	Stainless body <i>Prod No</i>	SPECS Inlet pressure: 100 psi Maximum temperature: 100°C
10 ml/min	CNV1A10S1	CNV1S10S1	
50 ml/min	CNV1A50S1	CNV1S50S1	
150 ml/min	CNV1A150S1	CNV1S150S1	
250 ml/min	CNV1A250S1	CNV1S250S1	
500 ml/min	CNV1A500S1	CNV1S500S1	

Optional colored knobs	Standard (.62") <i>Prod No</i>	Long (1.25") <i>Prod No</i>
Green	CNVEKG	CNVEKLG
Red	CNVEKR	CNVEKLR
Blue	CNVEKU	CNVEKLU
Silver	CNVEKS	CNVEKLS
Black	CNVEKB	CNVEKLB



Very similar in function to the Valco combo valves, these are the original, hex-bodied combo valves made by the Condyne division of VICI Metronics for nearly 30 years. Condyne products have been transferred to the Valco Houston location, where a number of improvements have been made.

Standard construction features an anodized aluminum body with Viton O-ring seals. Maximum inlet pressure is 100 psi, with a maximum

temperature of 100°C. The valve can be panel mounted through an 11/16" or 3/4" diameter hole. Valco 1/16" fittings are standard, but 1/8" fittings are also available. Nuts and ferrules are included.

Typically, the knob color is used as an indicator of the rated flow, but the standard knob can be changed if desired. A longer version of the knob is also available, as is an all brass valve (in OEM quantities). Consult the factory regarding these options.

Condyne combo valves

SPECS Maximum inlet pressure: 100 psi Maximum temperature: 100°C	Maximum flow @ 40psi He or N2	1/16" Valco fittings	1/8" Valco fittings	
	Knob color	Prod No	Prod No	
	10 ml/min	Green	CVA10GS1	CVA10GS2
	50 ml/min	Red	CVA50RS1	CVA50RS2
	150 ml/min	Blue	CVA150US1	CVA150US2
	500 ml/min	Black	CVA500BS1	CVA500BS2
	1 liter/min	Yellow	CVA1KYS1	CVA1KYS2



Gas Flow Controllers

Flow controllers provide a stable flow rate under varying pressure. VICI flow controllers are precision machined from aluminum or stainless bar stock to eliminate the contamination often found in die cast parts. Positive flow

shut-off is provided by an integral Viton-sealed adjustment valve.

With all our flow controllers, the inlet pressure must exceed the outlet pressure by 10 psi.

Model 100 gas flow controller

Fixed span upstream referenced flow controller

The Model 100 is available in a variety of preset maximum flow rates, from 150 mL/min to 10 liters/min (N₂ at 40 psi). Any flow controller in this series can be ordered with a 10-turn Spectrol digital dial (3 or 4 digits), to permit a visual indication of the flow setting.

All flow rates listed below are based on N₂ at 40 psi inlet pressure. Maximum inlet pressure is 200 psi.



SPECS

Preset max flow rates:

150 mL/min to 10 liters/min (N₂ at 40 psi).

Maximum inlet pressure:

200 psi

Maximum temperature:

100°C

Standard fittings:

■ 1/8" external tube fittings (EAOR22)

Other fittings are available. Contact the factory for further information.

Flow rate /min	Aluminum body Viton diaphragm Prod No	Aluminum body SS diaphragm Prod No	SS body Viton diaphragm Prod No	SS body SS diaphragm Prod No
With standard control knob				
0 - 150 mL	FC10AV1K	FC10AS1K	FC10SV1K	FC10SS1K
0 - 250 mL	FC10AV2K	FC10AS2K	FC10SV2K	FC10SS2K
0 - 850 mL	FC10AV3K	FC10AS3K	FC10SV3K	FC10SS3K
0 - 1.2 L	FC10AV4K	FC10AS4K	FC10SV4K	FC10SS4K
0 - 4.5 L	FC10AV5K	FC10AS5K	FC10SV5K	FC10SS5K
0 - 10.0 L	FC10AV6K	FC10AS6K	FC10SV6K	FC10SS6K
With Spectrol 3-digit dial				
0 - 150 mL	FC10AV1S3	FC10AS1S3	FC10SV1S3	FC10SS1S3
0 - 250 mL	FC10AV2S3	FC10AS2S3	FC10SV2S3	FC10SS2S3
0 - 850 mL	FC10AV3S3	FC10AS3S3	FC10SV3S3	FC10SS3S3
0 - 1.2 L	FC10AV4S3	FC10AS4S3	FC10SV4S3	FC10SS4S3
0 - 4.5 L	FC10AV5S3	FC10AS5S3	FC10SV5S3	FC10SS5S3
0 - 10.0 L	FC10AV6S3	FC10AS6S3	FC10SV6S3	FC10SS6S3
With Spectrol 4-digit dial				
0 - 150 mL	FC10AV1S4	FC10AS1S4	FC10SV1S4	FC10SS1S4
0 - 250 mL	FC10AV2S4	FC10AS2S4	FC10SV2S4	FC10SS2S4
0 - 850 mL	FC10AV3S4	FC10AS3S4	FC10SV3S4	FC10SS3S4
0 - 1.2 L	FC10AV4S4	FC10AS4S4	FC10SV4S4	FC10SS4S4
0 - 4.5 L	FC10AV5S4	FC10AS5S4	FC10SV5S4	FC10SS5S4
0 - 10.0 L	FC10AV6S4	FC10AS6S4	FC10SV6S4	FC10SS6S4

ALTERNATE FITTING TYPES

Models 100 and 300

The standard is the

EAOR22 1/8" external tube fitting. Alternative fitting types are listed below. Order separately.

Internal fitting with O-ring seal

	Prod No	Price
1/8" to 5/16-24	ZAOR22	\$14
1/16" to 5/16-24	ZAOR12	14

Model 202

The standard 1/8" NPT female pipe thread with pipe adapters to 1/16" OD tubing included. Another adapter is listed below. Order separately.

	Prod No	Price
1/8" NPT male pipe to Valco internal	PZA22	\$14

WHICH KIND OF CONTROLLER?

An **upstream-referenced** controller maintains the flow rate as long as the upstream (inlet) pressure is held constant.

A **downstream-referenced** controller maintains a constant flow under constant downstream (outlet) pressure.

Model 202 gas flow controller

Adjustable span upstream-referenced flow controller

SPECS

Flow range:
infinitely adjustable
Min: 5 mL/min
Max: 1.6 L/min
(N₂ at 40 psi)

Maximum inlet pressure:
200 psi

Maximum temperature:
100°C

Standard fittings:
■ 1/8" NPT female pipe threads
■ Pipe adapters to 1/16" OD tubing are included.

Other fittings are available. (See facing page.)

The Model 202 provides a user-variable span adjustment permitting it to be used for a variety of flow ranges. After the span is adjusted, the flow controller has a full 10 turns of resolution between the minimum and maximum flow rates. When equipped with a Spectrol digital dial, settings are reproducible to better than 1%.



	Aluminum body Viton diaphragm <i>Prod No</i>	Aluminum body SS diaphragm <i>Prod No</i>	SS body Viton diaphragm <i>Prod No</i>	SS body SS diaphragm <i>Prod No</i>
With standard control knob	FC22AV1K	FC22AS1K	FC22SV1K	FC22SS1K
With Spectrol 3-digit dial	FC22AV1S3	FC22AS1S3	FC22SV1S3	FC22SS1S3
With Spectrol 4-digit dial	FC22AV1S4	FC22AS1S4	FC22SV1S4	FC22SS1S4

Model 300 gas flow controller

Fixed span downstream-referenced flow controller

SPECS

Maximum flow rate:
1.6 L/min
with ambient
downstream pressure

Maximum inlet pressure:
200 psi

Maximum temperature:
100°C

Standard fittings:
■ 1/8" external tube fittings (EAOR22)

Other fittings are available. (See facing page.) Contact the factory for further information.

The Model 300 flow controller provides a stable flow rate when upstream pressure conditions vary, providing the downstream pressure remains constant.

All flow rates listed below are based on N₂ at 40 psi inlet pressure. Maximum inlet pressure is 200 psi.



	Aluminum body Viton diaphragm <i>Prod No</i>	Aluminum body SS diaphragm <i>Prod No</i>	SS body Viton diaphragm <i>Prod No</i>	SS body SS diaphragm <i>Prod No</i>
With standard control knob				
0 - 200 mL	FC30AV1K	FC30AS1K	FC30SV1K	FC30SS1K
0 - 300 mL	FC30AV2K	FC30AS2K	FC30SV2K	FC30SS2K
0 - 800 mL	FC30AV3K	FC30AS3K	FC30SV3K	FC30SS3K
0 - 1.6 L	FC30AV4K	FC30AS4K	FC30SV4K	FC30SS4K
With Spectrol 3-digit dial				
0 - 200 mL	FC30AV1S3	FC30AS1S3	FC30SV1S3	FC30SS1S3
0 - 300 mL	FC30AV2S3	FC30AS2S3	FC30SV2S3	FC30SS2S3
0 - 800 mL	FC30AV3S3	FC30AS3S3	FC30SV3S3	FC30SS3S3
0 - 1.6 L	FC30AV4S3	FC30AS4S3	FC30SV4S3	FC30SS4S3
With Spectrol 4-digit dial				
0 - 200 mL	FC30AV1S4	FC30AS1S4	FC30SV1S4	FC30SS1S4
0 - 300 mL	FC30AV2S4	FC30AS2S4	FC30SV2S4	FC30SS2S4
0 - 800 mL	FC30AV3S4	FC30AS3S4	FC30SV3S4	FC30SS3S4
0 - 1.6 L	FC30AV4S4	FC30AS4S4	FC30SV4S4	FC30SS4S4
With screwdriver adjustable operator				
0 - 750 mL	FC31AV1			

MORE INFORMATION

Male pipe adapters
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Micrometering Valves

Micrometering (needle) valves combine the ease of connection associated with Valco zero dead volume fittings with convenient bulkhead mounting. The very low internal volume and precision design make this valve ideal for use as a gas control valve in chromatographic systems.

The Viton® model is rated at 225°C, while a version with Kalrez™ seals is capable of continuous operation at 315°C. This allows a needle valve to be mounted directly within a heated oven, facilitating control of flow

switching in multidimensional systems while keeping the gases at oven temperature.

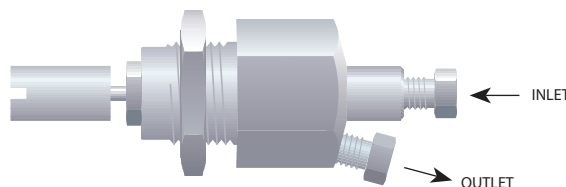
Valves are rated for maximum of 1000 psi gas. They are individually tested on a mass spectrometer leak detector to a helium leak rate specification of $< 1 \times 10^{-8}$ atm cc/sec.

An unlubricated version with a specially polished seat was designed to be used with our pulsed discharge detectors, and should be used upstream of any ultrapure gas system. There is also a 1/16" tube version.

1/16" micrometering valves

with Valco fittings

Seal	Lubrication	Prod No
Standard: 2–225 ml/min@ 15 psi N ₂ inlet		
Viton	Lubricated	ZBNV1
Viton	Non-lubricated	ZBNV1-D
Kalrez	Non-lubricated	ZBNV1-KZ
Fine control: 2–175 ml/min@ 15 psi N ₂ inlet		
Viton	Lubricated	ZBNV1F
Viton	Non-lubricated	ZBNV1F-D
Kalrez	Non-lubricated	ZBNV1F-KZ
Low flow: 2–90 ml/min@ 40 psi N ₂ inlet		
Viton	Lubricated	ZBNV1LF
Viton	Non-lubricated	ZBNV1LF-D
Kalrez	Non-lubricated	ZBNV1LF-KZ



1/16" micrometering valves

with 18" tubes

Seal	Lubrication	Prod No
Standard: 2–225 ml/min@ 15 psi N ₂ inlet		
Viton	Lubricated	BNV1
Viton	Non-lubricated	BNV1-D
Kalrez	Non-lubricated	BNV1-KZ
Low flow: 2–90 ml/min@ 40 psi N ₂ inlet		
Viton	Lubricated	BNV1LF
Viton	Non-lubricated	BNV1LF-D
Kalrez	Non-lubricated	BNV1LF-KZ



Combo Pressure Regulators



The Vici combo regulator is a combination regulator and shut-off valve. The pressure is set using the screwdriver adjustment in the center of the on/off knob. Turning the knob counterclockwise provides positive shutoff, while clockwise rotation restores gas pressure to within 0.05 psi of the setpoint.

The regulator is machined from aluminum bar stock and then hard-anodized to provide contamination-free service. It features a stainless steel diaphragm and Viton®-sealed stainless steel poppet. The compact size (3" x 1.125"

diameter) saves panel space and permits installation anywhere that an 11/16" hole can be located. Mounting hardware is supplied.

Available with outlet pressure ranges of 0-15 psi, 0-30 psi, or 0-60 psi, these regulators can be ordered with 1/16" or 1/8" Valco internal fittings or 1/8" external fittings. Other configurations are available in OEM quantities.

Maximum operating temperature is 100°C, and maximum supply pressure is 250 psig. The influence of supply pressure on outlet pressure is less than 0.1 psi per 10 psi change in supply pressure.

Combo pressure regulators

SPECS	Pressure range:	Valco internal fittings 1/16"	Valco internal fittings 1/8"	External fittings 1/8"
		Prod No	Prod No	Prod No
Maximum inlet pressure: 250 psi	0-15 psi	PR50A15Z1	PR50A15Z2	PR50A15E2
Maximum temperature: 100°C	0-30 psi	PR50A30Z1	PR50A30Z2	PR50A30E2
Wetted materials: ■ Anodized aluminum ■ Stainless steel ■ Viton	0-60 psi	PR50A60Z1	PR50A60Z2	PR50A60E2

ADAPTERS USED FOR VALCO AND CONDYNE CONTROL DEVICES



Prod No	Price	Used for	Description
ZAOR11	\$14	Diaphragm valve; optional on on/off valves	Valco 1/16" internal to 10-32 female
ZAOR12	14	Optional for Model 100 and 300 flow controllers	Valco 1/16" internal to 5/16-24 O-ring seal
ZAOR22	14	Optional for Model 100 and 300 flow controllers	Valco 1/8" internal to 5/16-24 O-ring seal
EAOR21	14	Air actuated prime/purge and on/off valves	External 1/8" to 10-32 O-ring seal
EAOR22	14	Standard on Model 100 and 300 flow controllers	External 1/8" to 5/16-24 O-ring seal